

# *Rhaphidophora petrieana* – a new aroid liane from tropical Queensland; with a synopsis of the Australian Araceae–Monstereae

A. Hay

## Abstract

Hay, A. (Royal Botanic Gardens Sydney, Mrs Macquaries Road, Sydney, NSW, Australia 2000) 1993. *Rhaphidophora petrieana* – a new aroid liane from tropical Queensland; with a synopsis of the Australian Araceae–Monstereae. *Telopea* 5(2):293–300. *Rhaphidophora petrieana* (Araceae–Monstereae) is described and illustrated. A synopsis of the tribe Monstereae in Australia and keys to the genera and species are provided.

## Introduction

The tribe Monstereae is one of only two pantropical tribes of Araceae, the other being the Lasieae (Hay 1988, 1992). Monstereae are most closely allied to tropical amphitrans-Pacific Spathiphyllaeae, including *Spathiphyllum* (itself amphitrans-Pacific) and *Holochlamys* (endemic to New Guinea). Since Engler, these two tribes have generally been considered to make up the subfamily Monsteroideae, though Bogner & Nicolson (1991) add West Malesian Anadendreae and Neotropical Heteropsidae in their revised Englerian classification. However, Grayum (1990) drew attention to difficulty in separating Monsteroideae from Pothoideae, and merged them, a move which Bogner & Nicolson have not followed and one which is regarded here as premature rather than incorrect.

Monstereae was last fully revised by Engler & Krause (1908) and since then only two generic monographs have been carried out, those of Malesian *Amydrium* (Nicolson 1968) and Neotropical *Monstera* (Madison 1977). Grayum (1990), Bogner & Nicolson (1991) and Hay & Mabberley (1991) have, with minor amendments, followed Englerian generic concepts for this tribe. However, although additional information has been provided on vegetative (French 1987a, 1987b, 1988; French & Tomlinson 1981; Nicolson 1960), pollen (Grayum 1984, 1990), floral (Eyde et al. 1967; French 1985, 1986; Carvell 1989), and seed (Madison & Tiffney 1976) anatomy, generic concepts remain problematic and particularly irksome in the Orient in the absence of further monographs. The historical bases for generic limits lie primarily in ovule number, placentation and albuminosity of the seed, while a wealth of information relating to vegetative architecture and to germination, establishment and climbing behaviour, mostly inaccessible in the herbarium, remains largely untapped [but see Blanc (1978, 1981); Hay (1986, 1990); Hay & Mabberley (1991); Madison (1977); and Ray (1987–1990) for some discussion of variation in germination and/or climbing characteristics in scandent aroids]. Hay (1990) has noted that generic limits in the oriental genera based on gynoeceal and seed characters are not only blurred but also cut across suites of complex vegetative characteristics and that re-evaluation is required in order to propose more firmly where homoplasy may exist.

The scheme of plant architectural models drawn up by Hallé & Oldeman (1970) and Hallé, Oldeman & Tomlinson (1978) has proved to have some practical applicability to Malesian and Australasian Monstereae (Hay 1986, 1990; Hay & Mabberley 1991),

at least with the less leptocaul species. For the Australian species the relevant models are Chamberlain's, in which a clinging sympodial orthotropic axis flowers terminally, and Stone's, in which a clinging and apparently monopodial (if undamaged) orthotropic axis bears free sympodial lateral spreading but distally orthotropic shoots bearing terminal inflorescences. [However, Scarrone's model, differing from Stone's in having endogenously rhythmic growth, may apply in some cases – further observations are required.] More or less abrupt metamorphoses from juvenile to adult habit have been recorded for some Monstereae (see Madison 1977; Ray 1990) commonly involving a shingle-leaved juvenile phase with short petioles and laminas appressed to the substrate and an adult long-petioled and hanging-bladed phase (e.g. Malesian *Rhaphidophora korthalsii* Schott). Such is not yet recorded for Australian species, though *R. pachyphylla* K. Krause from New Guinea and Northern Queensland appears to be a persistently juvenile shingle-leaved species. The remainder simply enlarge into maturity without sudden or conspicuous alteration of habit, other than the emission of free lateral branches in some cases.

**Key to the genera of Araceae–Monstereae in Australia**

- 1 Ovule solitary, basal; seeds exalbuminous ..... **Scindapsus**
- 1 Ovules few to many; seeds albuminous ..... **2**
- 2 Ovules numerous; stigmas punctate; seeds minute ..... **Rhaphidophora**
- 2 Ovules two to few; stigmas mostly slit-like; seeds stony, over 2 mm long  
..... **Epipremnum**

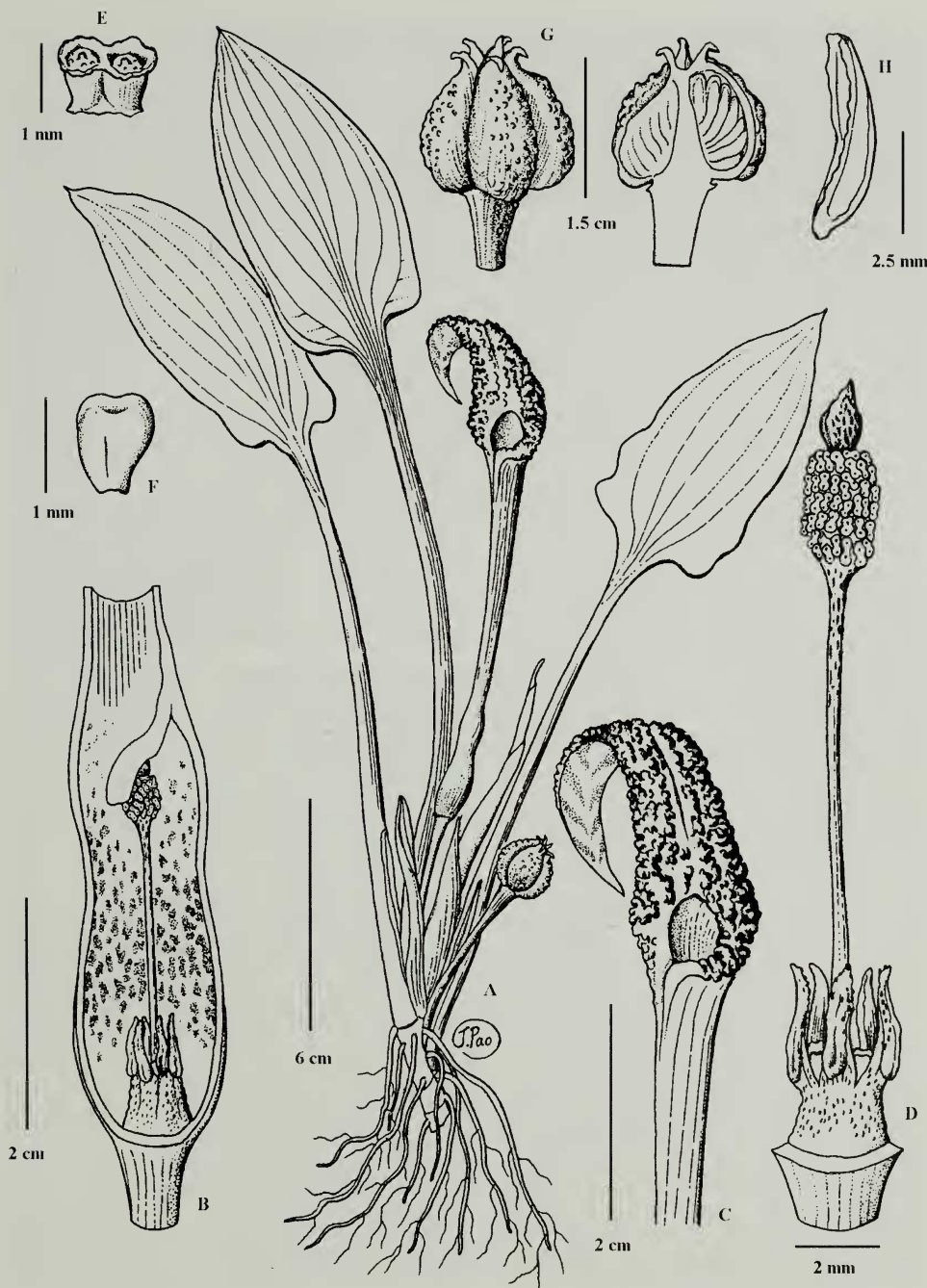
As the generic characters are somewhat obscure, and current generic concepts probably inadequate reflections of phylogenetic relationship, a single key to the species of Australian Monstereae is given. It is necessary, at regional level, to distinguish *R. petriana*, described below, not only from other Australian *Rhaphidophora* species but also from other easily confused members of the Monstereae not hitherto recorded in formal Australian botanical literature. A synopsis of those species is therefore given. Descriptions and exsiccatæ will appear elsewhere, in a full account of the Araceae in Australia.

**Field key to the species of Araceae–Monstereae in Australia**

- 1 Leaf blades very broadly ovate, appressed to substrate, with the petiole much shorter than the blade and the sheath ligulate ..... **Rhaphidophora pachyphylla**
- 1 Not so ..... **2**
- 2 Plant with free lateral flowering shoots ..... **3**
- 2 Inflorescences borne on adherent climbing shoots ..... **4**







**Figure 1.** *Cryptocoryne zaidiana* Ipoh & Tawan.  
A Plant with inflorescence and fruit; B inner surface of the kettle; C limb surface and collar; D spadix showing the male and female flowers; E thecae; F stamen; G syncarp with verrucose surface; H seed. (A-F from the holotype CST 2548; G-H from the CST 2549 - drawn from the fresh material).



with distinct dark purple protuberances, lower surface whitish or faintly purplish; collar distinct, creamy; throat surface deep purplish or sprayed with purplish spots, surface smooth. **Female flowers** c. 6, stigma ovate-elliptic, purplish; ovary whitish elongate, 3 mm long, 1 mm wide, **Male flowers** c. 50, smooth, creamy or light yellow; naked axis spadix 9–10 mm long, purplish; sterile appendix c. 1.5 x 1.0 mm, ovate, deep purple; olfactory bodies dark purple; flap ovate, 4–5 x 3–3.5 mm, whitish. **Fruit peduncle** 3.5–6.0 cm long, 3–4.5 mm diam., whitish or sometimes speckled with dark purple spots. **Syncarp** broadly ovoid, 1.5–1.7 cm long, 12–16.5 mm diam., dull green speckled with dark purple, slightly verrucose surface, apex distinctly apiculate, dark green-purple. **Seeds** elongate 6–7 mm long, 1.8–2.0 mm broad at base, dark purple in the upper portion, lower part whitish, surface slightly striated. Embryo with three long, green plumular processes.

*Other specimens studied:* Type locality, whole plant with inflorescence, 16 June 2004, C.S. Tawan, I.B. Ipor & A. Mohd Rizan CST 2545 (HUMS) – in spirit from cultivated plant collected from the type locality; herbarium specimens from the type locality, whole plant with mature syncarp, 2 July 2004, C.S. Tawan, I.B. Ipor & A. Mohd Rizan CST 2550 (HUMS); whole plant with inflorescence and young syncarp, 2 July 2004, C.S. Tawan, I.B. Ipor & A. Mohd Rizan CST 2551 (HUMS); whole plant with inflorescence, 2 July 2004, C.S. Tawan, I.B. Ipor & A. Mohd Rizan CST 2552 (SAR).

*Distribution:* Endemic in Sarawak, as yet known only from Sungai Mering, Tinjar, Miri Division.

*Habitat:* *Cryptocoryne zaidiana* occurs in small patches on muddy ground (sandy clay soil) with a litter of leaves and twigs. The river is approximately 5–7 m wide and flooded with a considerable slow current after a period of heavy rain. The riverbank is established with secondary riverine forest (15–18 years after padi planting according to the local people). The forest undergrowth is mainly dominated by bemban, *Donax grandis* (Marantaceae). The river normally becomes shallow or sometimes dries up after dry periods. At this time, this river is a popular place for the local people to ‘mansai’ (to fish using round-shaped nets to scoop in the shallow water to catch small fish). This regular activity appears to disturb the habitat of *C. zaidiana*. More severe disturbance is imminent as the area is earmarked for oil palm plantations.

*Notes:* *Cryptocoryne zaidiana* shows in its habitat and morphological characteristics certain similarity with *C. lingua*. These two species thrive well on mudflats of riverine clay soil along the fringes of riversides and



**Plate 1.** *Cryptocoryne zaidiana* Ipoh & Tawan.  
A Plant with unopened inflorescence; B, C limb surface and collar; D syncarp with verrucose surface; E seeds; F the male and the female zones.